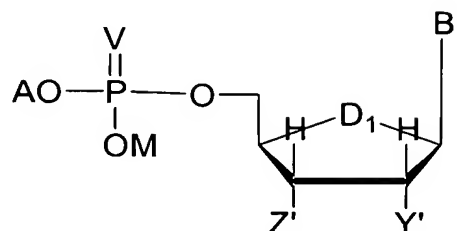


WHAT IS CLAIMED:

1. A compound of Formula Ib':

Formula Ib'



5 wherein:

$\text{V} = \text{O};$

$\text{A} = \text{M};$

$\text{M} = \text{H}$ or a pharmaceutically-acceptable inorganic or organic counterion;

$\text{D}_1 = \text{O};$

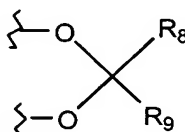
10 $\text{Y}' = \text{H}, \text{OH}, \text{or } \text{OR}_1;$

$\text{Z}' = \text{H}, \text{OH}, \text{or } \text{OR}_2;$ with the proviso that at least one of Y' and Z' is OR_1 or $\text{OR}_2;$

R_1 and R_2 are residues which are linked directly to the 2' and/or 3' hydroxyls of the furanose or carbocycle via a carbon atom according to Formula II, or linked directly to two of the 2' and 3' hydroxyls of the furanose or carbocycle via a common carbon atom according to

15 Formula III,

Formula III



20 wherein:

O is the 2' and 3' oxygens of the furanose; and

the 2' and 3' oxygens of the furanose are linked by a common carbon atom to form a cyclical acetal; and

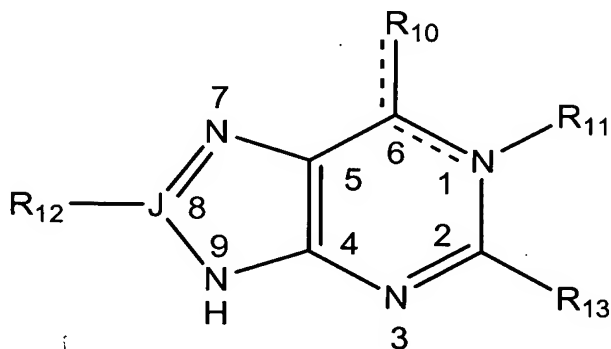
25 R_8 is hydrogen; and

R₉ is selected from the group consisting of aralkyl, aryl, substituted aralkyl, and substituted aryl;

in which the aralkyl groups are straight chained from 1 to 5 carbons, with or without unsaturation and without heteroatoms in the alkyl portion, and are monocyclic moieties from 5 to 6 carbons in the aryl portion; and the aryl groups are monocyclic moieties from 4 to 6 carbons, with or without heteroatoms;

B' is a purine residue according to general Formula IV:

Formula IV



wherein J = carbon;

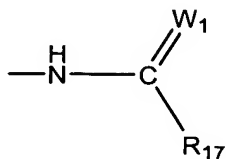
R₁₁ is absent;

R₁₂ is hydrogen;

R₁₃ is hydrogen;

R₁₀ is acylamino, according to Formula VI;

Formula VI



wherein:

NH is the amino residue at the C-6 position in a purine or the amino residue at the C-4 position in a pyrimidine;

C is a carbon atom;

W₁ is oxygen; and

5 R₁₇ is amino or mono- or disubstituted amino such that the moiety according to Formula VI is a urea.

2. The Compound according to Claim 1, wherein R₉ is selected from the group consisting of aralkyl, aryl, substituted aralkyl, and substituted aryl; in which the aralkyl
10 groups are straight chained from 3 to 4 carbons, with or without unsaturation and without heteroatoms in the alkyl portion, and are monocyclic moieties of 6 carbons without heteroatoms in the aryl portion; and the aryl groups are monocyclic moieties of 6 carbons, without heteroatoms;

15 3. A compound selected from the group consisting of: 2'3' phenylacetaldehyde acetal-6-N-phenylurea AMP; 2'3' phenylacetaldehyde acetal-6-N-n-hexylurea AMP; 2'3' phenylacetaldehyde acetal-6-N-ethylurea AMP; 2'3' phenylacetaldehyde acetal-6-N-cyclopentylurea AMP; 2'3' cinnamyl acetal-6-N-n-hexylurea AMP; 2'3' cinnamyl acetal-6-N-ethylurea AMP; 2'3' cinnamyl acetal-6-N-phenylurea AMP; 2'3' cinnamyl acetal-6-N-n-propylurea AMP; 2'3' cinnamyl acetal-6-N-n-butylurea AMP; 2'3' phenylpropargyl acetal-6-N-phenylurea AMP; 2'3' phenylpropargyl acetal-6-N-n-hexylurea AMP; 2'3' phenylpropargyl acetal-6-N-n-butylurea AMP; 2'3' phenylpropargyl acetal-6-N-n-propylurea AMP; 2'3' phenylpropargyl acetal-6-N-ethylurea AMP; 2'3' benzaldehyde acetal-6-N-ethylurea AMP; 2'3' benzaldehyde acetal-6-N-n-propylurea AMP; 2'3' benzaldehyde acetal-
20 6-N-n-butylurea AMP; 2'3' benzaldehyde acetal-6-N-n-hexylurea AMP; and 2'3' benzaldehyde acetal-6-N-cyclopentylurea AMP.

4. A pharmaceutical formulation comprising the compound according to Claim 1 and a pharmaceutically acceptable carrier.

30 5. A pharmaceutical formulation comprising the compound according to Claim 3 and a pharmaceutically acceptable carrier.

6. A method of preventing or treating diseases or conditions associated with platelet aggregation comprising:

administering to a subject the pharmaceutical formulation according to Claim 4, wherein said compound is effective to bind P2Y₁₂ receptors on platelets and inhibit ADP-induced platelet aggregation.

7. A method of preventing or treating diseases or conditions associated with platelet aggregation comprising:

administering to a subject the pharmaceutical formulation according to Claim 5, wherein said compound is effective to bind P2Y₁₂ receptors on platelets and inhibit ADP-induced platelet aggregation.

8. The method according to Claim 6, wherein said pharmaceutical composition reduces the incidence of dose-related adverse side effects of other therapeutic agents that are used to prevent, manage or treat platelet aggregation disorders.

9. The method according to Claim 6, wherein said diseases or conditions associated with platelet aggregation are disorders or procedures characterized by thrombosis, primary arterial thrombotic complications of atherosclerotic disease, thrombotic complications of interventions of atherosclerotic disease, thrombotic complications of surgical or mechanical damage, mechanically-induced platelet activation, shunt occlusion, thrombosis secondary to vascular damage and inflammation, indications with a diffuse thrombotic/platelet consumption component, venous thrombosis, coronary arterial thrombosis, pathological effects of atherosclerosis and arteriosclerosis, platelet aggregation and clot formation in blood and blood products during storage, chronic or acute states of hyper-aggregability, reocclusion of an artery or vein following fibrinolytic therapy, platelet adhesion associated with extracorporeal circulation, thrombotic complications associated with thrombolytic therapy, thrombotic complications associated with coronary and other angioplasty, or thrombotic complications associated with coronary artery bypass procedures.

10. The method according to Claim 9, wherein said disorders or procedures associated with thrombosis are unstable angina, coronary angioplasty, or myocardial infarction; said primary arterial thrombotic complications of atherosclerosis are thrombotic stroke, peripheral

vascular disease, or myocardial infarction without thrombolysis; said thrombotic complications of interventions of atherosclerotic disease are angioplasty, endarterectomy, stent placement, coronary or other vascular graft surgery; said thrombotic complications of surgical or mechanical damage are associated with tissue salvage following surgical or
5 accidental trauma, reconstructive surgery including skin flaps, or reductive surgery; said mechanically-induced platelet activation is caused by cardiopulmonary bypass resulting in microthromboembolism and storage of blood products; said shunt occlusion is renal dialysis and plasmapheresis; said thromboses secondary to vascular damage and inflammation are vasculitis, arteritis, glomerulonephritis or organ graft rejection; said indications with a diffuse
10 thrombotic/platelet consumption component are disseminated intravascular coagulation, thrombotic thrombocytopenic purpura, hemolytic uremic syndrome, heparin-induced thrombocytopenia, or pre-eclampsia/eclampsia; said venous thrombosis are deep vein thrombosis, veno-occlusive disease, hematological conditions, or migraine; and said coronary arterial thrombosis is associated with unstable angina, coronary angioplasty or acute
15 myocardial infarction.

11. The method according to Claim 10, wherein said hematological conditions are thrombocythemia or polycythemia.

20 12. The method according to Claim 9, wherein said pathological effects of atherosclerosis and arteriosclerosis are arteriosclerosis, acute myocardial infarction, chronic stable angina, unstable angina, transient ischemic attacks, strokes, peripheral vascular disease, arterial thrombosis, preeclampsia, embolism, restenosis or abrupt closure following angioplasty, carotid endarterectomy, or anastomosis of vascular grafts; said chronic or acute states of
25 hyper-aggregability is caused by DIC, septicemia, surgical or infectious shock, post-operative trauma, post-partum trauma, cardiopulmonary bypass surgery, incompatible blood transfusion, abruptio placenta, thrombotic thrombocytopenic purpura, snake venom or immune diseases.

30 13. The method according to Claim 9, wherein said reocclusion of an artery or vein following fibrinolytic therapy is inhibited by internal administration of said compound with a fibrinolytic agent.

14. The method according to Claim 13, wherein said fibrinolytic agent is a natural or synthetic product which directly or indirectly causes lysis of a fibrin clot.

15. The method according to Claim 13, wherein said fibrinolytic agent is a plasminogen activator selected from the group consisting of anistreplase, urokinase, pro-urokinase, streptokinase, tissue plasminogen activator and mutants, or variants thereof, which retain plasminogen activator activity.

16. The method according to Claim 15, wherein said variants are selected from the group consisting of variants which have been chemically modified, variants which one or more amino acids have been added, deleted or substituted, and variants with one or more modified functional domains.

17. The method according to Claim 16, wherein said modified functional domains are added, deleted or altered by combining the active site of one plasminogen activator or fibrin binding domain of another plasminogen activator or fibrin binding molecule.

18. The method according to Claim 6, wherein said administering is systemic administration of said compound to a subject.

19. The method according to Claim 18, wherein said systemic administration is an administration selected from the group consisting of: injecting an injectable form of said compound; administering by mouth an oral form of said compound; applying to the skin a transdermal patch or a transdermal pad containing said compound; administering a liquid/liquid suspension of said compound via nose drops or nasal spray; administering a nebulized liquid of said compound to oral or nasopharyngeal airways; administering rectally a suppository form of said compound; administering vaginally said compound in dosage unit formulations containing conventional non-toxic pharmaceutically acceptable carriers, adjuvants and vehicles; administering said compound intravitreally; and administering via intra-operative instillation a gel, cream, powder, foam, crystals, liposomes, spray or liquid suspension form of said compound; such that a therapeutically effective amount of said compound contacts the target platelets of said patient via systemic absorption and circulation.

20. The method according to Claim 18, wherein said systemic administration comprises infusion of said compound to target platelets via a device selected from the group consisting of a pump catheter system and a continuous or selective release device.

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